

## Chemistry Placement Exam . . .

Students may by-pass CHEM 1103 by passing a one hour Chemistry Placement Exam. Click [here](#) for a sample exam and the schedule of placement exam offerings.

A one hour Chemistry Placement Examination is being offered in each Orientation Session this summer. The purpose of this exam is to place students in either CHEM 1103, University Chemistry I, or CHEM 1123, University Chemistry II, and CHEM 1121L, University Chemistry II Lab. Students placed in CHEM 1123/1121L are given credit for CHEM 1103/1101L and CHEM 1123/1121L upon satisfactorily completing CHEM 1123/CHEM 1121L with a C or above. This exam is of particular importance to Chemical Engineering students because earning a passing score (70%) demonstrates that a student is ready to enter the Chemical Engineering program. The exam may only be taken once. Students scoring a 4C or better on the Chemistry AP Examination receive credit for CHEM 1103/1101L and CHEM 1123/1121L.

The Chemistry Placement Exam is scheduled for 8:15 am in the Chemistry Building, Room 105, on Day One of each new student orientation session.

Session	Session Date	Population Served	Chemistry Placement Date, Time
1	June 8-9	Honors Students	June 8, 8:15 am
2	June 9-10	Honors Students (except AFLS, ARCH, EDUC)	June 9, 8:15 am
3	June 10-11	All Students	June 10, 8:15 am
4	June 11-12	All Students	June 11, 8:15 am
5	June 15-16	All Students	June 15, 8:15 am
6	June 16-17	All Students (except ARCH)	June 16, 8:15 am
7	June 17-18	All Students (except ARCH)	June 17, 8:15 am
8	June 18-19	All Students	June 18, 8:15 am
9	June 22-23	All Students	June 22, 8:15 am
10	June 23-24	All Students (except ARCH)	June 23, 8:15 am
11	June 24-25	All Students (except ARCH)	June 24, 8:15 am
12	June 25-26	All Students	June 25, 8:15 am
13	June 29-30	All Students	June 29, 8:15 am

14	August 10-11	All Students <b>Registration opens July 1st</b>	August 10, 8:15 am
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The placement exam covers the following areas that are taught in a good high school chemistry course:

- Symbols, formulas, formula weights
- The mole concept
- Chemical stoichiometry, calculations based on a given equation
- Atomic size, ionization energy, electronegativity, etc. trends
- Molarity
- Nomenclature
- Subshell configurations
- Lewis electron dot representations
- Shapes of molecules and ions
- Balancing equations
- Acid-base equations

For more information on the content of the placement exam, see the sample exam on the next page. For more information on the offering of the exam, contact:

- University of Arkansas Chemistry Department
  - Dr. Bill Durham ([bdurham@uark.edu](mailto:bdurham@uark.edu))
  - Dr. Heather Jorgensen ([hjorgen@uark.edu](mailto:hjorgen@uark.edu))

## Chemistry Placement Test Review Questions—Summer 2009

1. Write the chemical formula for sulfurous acid.
2. What are the names of each of the following polyatomic ions?
  - $\text{C}_2\text{O}_4^{2-}$
  - $\text{SO}_4^{2-}$
  - $\text{SO}_3^{2-}$
  - $\text{NH}_4^+$
  - $\text{ClO}_4^-$
3. Which of the following substances would be classified as a mixture?
  - a canister of  $\text{N}_2\text{O}_4$  gas
  - a beaker of liquid ethanol ( $\text{CH}_3\text{CH}_2\text{OH}$ )
  - a sample of pewter (an alloy)
  - a sample of  $\text{N}_2$  gas
4. What is the strongest acid and what is the strongest base?
5. An ion with a 2+ charge has 10 electrons and 12 neutrons. What is the ion?
6. If calcium bromide and potassium sulfate are mixed, will a precipitate form?
7. Balance the follow equation.
$$\text{NaNO}_3(\text{s}) + \text{H}_2\text{SO}_4(\text{l}) \rightarrow \text{Na}_2\text{SO}_4(\text{s}) + \text{HNO}_3(\text{g})$$
8. In Problem 7, how many ml of a 1.225 M solution of sodium nitrate are required to produce 5.630 grams of sodium sulfate?
9. Which of the following forms of chlorine has the HIGHEST oxidation number?
  - HCl
  - $\text{Cl}_2$
  - HClO
  - $\text{HClO}_4$
  - $\text{HClO}_3$
10. Draw the Lewis dot structure for  $\text{NO}_2^+$ .

11. Write the electron configuration for Se. How many valence electrons does Se have?
12. What is the molecular geometry of  $\text{NO}_3^-$  ?
13. Balance the reaction  $\text{MnO}_2(\text{s}) + \text{I}^-(\text{aq}) \rightarrow \text{Mn}^{2+}(\text{aq}) + \text{I}_2(\text{s})$  under basic conditions.  
What is the stoichiometric coefficient for  $\text{Mn}^{2+}$  in the balanced equation?
14. If one regular Tums tablet contains 500 mg of  $\text{CaCO}_3(\text{s})$ , how many ml of 1.00 M stomach acid (as HCl) could it neutralize? The molar mass (molecular weight) for  $\text{CaCO}_3$  is 100.1 g/mol.
15. What is the formal charge on N in the most stable resonance form of  $\text{CNO}^-$  ?